Model Curriculum

QP Name: Grader Machine Operator

Electives: Opencast/ Underground Metal/ Underground Coal

QP Code: MIN/Q1405

QP Version: 1.0

NSQF Level: 3.0

Model Curriculum Version: 1.0

Skill Council for Mining Sector || B-311, Okhla Industrial Area, Phase-I, New Delhi-110020

Table of Contents

Training Parameters

Sector	Mining
Sub-Sector	Mining Operation
Occupation	Loading and Hauling - Opencast, Loading and Hauling - Underground
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8342.0400
Minimum Educational Qualification and Experience	10th grade pass OR 9th grade pass (with 1-year relevant experience) OR 8th grade pass (with 2 years relevant experience) OR 5th grade pass (with 5 years relevant experience) OR Previous relevant Qualification of NSQF Level (2.5- Jr. Grader Operator with 1.5 year of experience in relevant field)
Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	20 years
Last Reviewed On	31 January, 2024
Next Review Date	30 January, 2027
NSQC Approval Date	31 January, 2024
QP Version	1.0
Model Curriculum Creation Date	31 January, 2024

Model Curriculum Valid Up to Date	30 January, 2027
Model Curriculum Version	1.0
Minimum Duration of the Course	420 hours
Maximum Duration of the Course	420 hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner will be able to:

- Demonstrate how to prepare the grader for operations and conduct routine maintenance.
- Show how to perform the grader operations.
- Discuss how to transport the grader.
- Discuss health, safety and environmental guidelines for underground metalliferous mines, coalmines and open cast mines.

Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration (Hours)	Practical Duration (Hours)	On-the-Job Training Duration (Mandatory) (Hours)	On-the-Job Training Duration (Recommended) (Hours)	Total Duration (Hours)
MIN/N1416: Prepare the grader for operations and conduct routine maintenance *NOS Version No. 1* NSQF Level- 3	**30:00**	**10:00**	**20:00**	-	**60:00**
Module 1 - Introduction to the sector and the job role of Grader Machine Operator	10:00	00:00	-	-	10:00
Module 2: Prepare the grader for operations and conduct routine maintenance	20:00	10:00	20:00	-	50:00
MIN/N1417: Perform the grader operations *NOS Version No.1* NSQF Level- 3	**20:00**	**40:00**	**60:00**	-	**120:00**
Module 3: Perform the grader operations	20:00	40:00	60:00	-	120:00
MIN/N1418: Transport the grader *NOS Version No.1* NSQF Level- 3	**30:00**	**50:00**	**40:00**	-	**120:00**
Module 4: Transport the grader	30:00	50:00	40:00	-	120:00
DGT/VSQ/N0102: Employability Skills (60 Hours) *NOS Version No. 1*	**60:00**	**00:00**	**00:00**	-	**60:00**

NSQF Level- 4					
Introduction to Employability Skills	01:30	00:00	00:00	-	01:30
Constitutional values - Citizenship	01:30	00:00	00:00	-	01:30
Becoming a Professional in the 21st Century	02:30	00:00	00:00	-	02:30
Basic English Skills	10:00	00:00	00:00	-	10:00
Career Development & Goal Setting	02:00	00:00	00:00	-	02:00
Communication Skills	05:00	00:00	00:00	-	05:00
Diversity & Inclusion	02:30	00:00	00:00	-	02:30
Financial and Legal Literacy	05:00	00:00	00:00	-	05:00
Essential Digital Skills	10:00	00:00	00:00	-	10:00
Entrepreneurship	07:00	00:00	00:00	-	07:00
Customer Service	05:00	00:00	00:00	-	05:00
Getting Ready for Apprenticeship & Jobs	08:00	00:00	00:00	-	08:00
Total Duration	**140:00**	**100:00**	**120:00**	**-**	**360:00**

Elective Modules - (mandatory to select at least one)

The table lists the elective modules, their duration and mode of delivery.

Elective 1: Opencast

NOS and Module Details	Theory Duration (Hours)	Practical Duration (Hours)	On-the-Job Training Duration (Mandatory) (Hours)	On-the-Job Training Duration (Recommended) (Hours)	Total Duration (Hours)
MIN/N1703: Follow Health, Safety, and Environmental Guidelines for opencast mines *NOS Version No. 2.0* NSQF Level-3.5	**10:00**	**20:00**	**30:00**	**-**	**60:00**
Module 6: Follow Health, Safety and Environmental Guidelines for Opencast Mines	10:00	20:00	30:00	-	60:00
Total Duration	**10:00**	**20:00**	**30:00**	**-**	**60:00**

Elective 2: Underground Metal

NOS and Module Details	Theory Duration (Hours)	Practical Duration (Hours)	On-the-Job Training Duration (Mandatory) (Hours)	On-the-Job Training Duration (Recommended) (Hours)	Total Duration (Hours)
MIN/N1702: Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines *NOS Version No. 2.0* NSQF Level-3.5	**10:00**	**20:00**	**30:00**	**-**	**60:00**
Module 5: Follow Health, Safety and Environmental Guidelines for Underground Metalliferous Mines (UMM)	10:00	20:00	30:00	-	60:00
Total Duration	**10:00**	**20:00**	**30:00**	**-**	**60:00**

Elective 3: Underground Coal

NOS and Module Details	Theory Duration (Hours)	Practical Duration (Hours)	On-the-Job Training Duration (Mandatory) (Hours)	On-the-Job Training Duration (Recommended) (Hours)	Total Duration (Hours)
MIN/N1704: Follow Health, Safety, and Environmental guidelines for underground coal mines *NOS Version No. 2.0* NSQF Level-3.5	**10:00**	**20:00**	**30:00**	**-**	**60:00**
Module 7: Follow Health, Safety and Environmental Guidelines for Underground Coal Mines	10:00	20:00	30:00	-	60:00
Total Duration	**10:00**	**20:00**	**30:00**	**-**	**60:00**

Module Details

Module 1: Introduction to the sector and the job role of Grader Machine Operator

Mapped to- MIN/N1416, v1.0

Terminal Outcomes:

- Discuss the scope of mining industry.
- Explain the role and responsibility of the Grader Operator

Duration: *10:00 (Hours)*	**Duration**: *00:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of the mining industry. • Discuss the provision of wages, working hours, leave, and accident compensation as per the Mines Act-1952. • Explain the different types of mines such as open cast mines, underground mines, etc. • Explain basic terminologies and machineries used in opencast mines, underground mines, etc. • Describe the working cycle of opencast mines, underground mines, etc. • List the role and responsibilities of the sampler. • Explain various types of risks involved in Underground Mines, Open Cast mines and Metalliferous mines.	
Classroom Aids	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers	
Tools, Equipment and Other Requirements	
Posters for describing different types of mines.	

Module 2: Prepare the grader for operations and conduct routine maintenance

Mapped to- MIN/N1416, v1.0

Terminal Outcomes:

- Describe about the grader machine and its operation
- Demonstrate how to conduct pre-operation checks to ensure safety and efficiency
- Discuss how to comply with scheduled maintenance

Duration: *20:00 (Hours)*	**Duration**: *10:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe about different types of mines and detail of the mine he is working in • Throw light on mine organisation, time keeping, need for discipline and punctuality • Highlight the benching inquarries, dressing of overhangs, undercuts, fencing, first aid and hygiene • State the standing orders in force at the mine and safety in the vicinity of machinery • Cite about the shot firing and safety regulations, how and where to take shelter • Discuss how to ensure the purpose of attachments and accessories such as shouldering boot is used to prevent spillage etc. • Highlight the duties of workmen • Discuss about the provision of wages, working hours and accident compensation as per Mines act • State the mining safety procedures • Throw light on how to identify the regulatory documents required for the vehicle • Cite the impact of violation of safely procedures • Discuss the job specific documents e.g., daily maintenance checklist and importance of the same • Explain the risk and impact of not following defined procedures/work instructions • State the escalation matrix for reporting identified problems • Estimate the cost of equipment and loss for the organization that results from damage of equipment	• Show how to identify the different types and sizes of graders, e.g., rigid articulating etc., and relevant manufacturers specifications as required • Demonstrate how to check the function of major components, such as circle, mold board, ripper, scarifier, drive train and their importance • Show how to check the common types of ground engaging tools, such as mould board cutting edges (e.g., Carbide, standard, etc.), ripper tooth • Display how to identify different types of attachments and accessories: and such as V-blades, one-way blades, push-blades, ripper, scarifier, grade control system [e.g., Global Positioning System (GPS), laser, shouldering boot etc. • Show how to check the basic tools and supplies associated with grader, such as hammer, screwdrivers, pliers, self-locking pliers, adjustable wrench, assorted other wrenches, grease etc. • Display how to check tyre conditions and inflation pressure • Show how to inspect and service lubrication system such as low oil levels, dirty filler cap, adjust the oil level • Display how to inspect and service electrical system thorough visual inspection and brief operation in idle condition • Apply appropriate techniques to inspect and service hydraulic systems & suspension systems thorough visual inspection and brief operation if required such as grease pivot points, check hydraulic oil levels, use spill kit

• Cite all direct/indirect cost of accidents to the organization • Cite how to maintain a checking/maintenance log book to record all activities to be performed before starting the Grader • Elucidate the implications of delays in process to the organization • State how to read indicators that signal need for replacement • Highlight the locally prepared emergency response/disaster management plan • Cite the normal operating conditions • Discuss about the correct engine oil, lubrication system, components, and functions • Describe about the electrical system, components and functions • Explain about the hydraulic systems, components, and functions • Discuss about the cooling system, components, and functions, such as that fan belts are used to turn fan for cooling • State the load bearing structure of the machine • Elucidate the operator station and components, such as seat, instrument panel and control systems, operating levers, communication devices etc. • Highlight how to do monitoring and warning systems and components • State the impact of weather and seasonal conditions on start-up procedures • Illuminate the common troubles and remedies • Illustrate the signage, mining area signs and other safety and emergency signals • Cite the response to emergencies such as fire, accident, major failure etc. • Explain the various brake Mechanisms/Systems • Describe the various technical aspects like road gradient, turning angle, Road Geometry etc.	• Show how to inspect and service engine & transmission system to perform basic service such as add coolant, use spill kit • Demonstrate how to inspect and service fuel system & air intake system through visual inspection and brief period of idle running, perform basic service, such as fill fuel, clean air filter • Show how to read maintenance records and documentation relating to service, such as log books and equipment manual • Show how to perform scheduled maintenance
Classroom Aids	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards	
Tools, Equipment and Other Requirements	

Grader, pneumatically and hydraulic power tools, circle, mould board cutting edges (e.g., carbide, standard etc.), ripper tooth, scarifier, drive train, articulating truck, V-blades, one-way blades, push-blades, grade control system [e.g., Global Positioning System (GPS), laser, shouldering boot, batteries, logbook, equipment manual, exhaust pipe, hammer, screwdrivers, pliers, self-locking pliers, adjustable wrench, grease gun, Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, Gum Boots/ Safety shoes, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts

Module 3: Perform the grader operations

Mapped to- MIN/N1417, v1.0

Terminal Outcomes:

- Discuss how to comply with grades and stakes
- Demonstrate how to operate grader
- Explain how to follow shutdown procedure

Duration: *20:00 (Hours)*	**Duration**: *40:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the different types of mines and detail of the mine one is working in • Illustrate how to recognize symbols and markings used on job site • State mine Organisation, time keeping, need for discipline and punctuality • Discuss how to interpret survey markers, construction grades, and stakes to differentiate between types of survey markers, construction grades, and stakes identify what is indicated by different types of survey markers, construction grades, and stakes • Highlight the benching in quarries, dressing of overhangs, undercuts, fencing, first aid and hygiene • Cite the standing orders in force at the mine and safety in the vicinity of machinery • Describe how to ensure the use of grade-checking devices such as laser levels, line levels, sight levels and check grades using information on stakes and plans • Cite about shot firing and Safety regulations how and where to take shelter • Explain how to set up equipment correctly to adjust to factors affecting safe operation of equipment, maintain stability of equipment, position equipment correctly communicates with traffic control person/signaller • Highlight the duties of workmen	• Display how to mark stakes/surface with appropriate symbols or markings, such as coloured paint, ribbons • Show how to install attachments to the equipment following correct procedures and mechanisms specified by the equipment manufacturer • Apply suitable techniques to use tools for installing attachments, positions equipment and attachments for installation and installs attachments safely • Show how to use different operating control conditions • Role play the situation on how to communicate with others, such as site personnel, signaller, traffic control person use and respond to hand and audible signals • Display how to scarify and rip surface materials, such as reclaiming road surface materials to maintain road within the capabilities and limitations of equipment and site obstructions and hazards, such as underground utilities • Show how to create rough/finish graded itches in accordance with job specifications • Display how to create slopes (also known as inclines) by cutting or filling and blending materials in accordance with job specifications • Show how to identify appropriate parking location and park equipment according to company policies and procedures, lower attachments before shutting down • Demonstrate how to shut down and secures equipment as per company policy and procedures and manufacturer's specification

• Cite the provision of wages, working hours and accident compensation as per Mines act • State the mining safety procedures • Throw light on the impact of violation of safely procedures • Describe how to monitor performance of equipment from gauges and symbols, and using own senses and judgment to monitor/ adjust performance and identify equipment problems • Cite the types of documentation in organization e.g., daily maintenance checklist and importance of the same • Explain how to identify and troubleshoot equipment problems and possible solutions, communicate problems accurately to others, such as maintenance personnel if required. • Highlight risk and impact of not following defined procedures/work instructions • Throw light on how to observe and respond to movement of others (people, vehicles, and other equipment in work area while performing tasks • Elucidate the rules and regulations of mine as per standard operating procedure (SOP) • Cite the risk and impact of not following Organization's SOP • Describe how to optimize equipment capabilities by position equipment correctly by adjusting operation to accommodate weather conditions, materials being handled, limitations of equipment, ground conditions, seasonal conditions, and stability characteristics adjust work procedures as necessary • Discuss the escalation matrix for reporting identified problems • Explain the duties and responsibilities associated with his job role as per the employer	to protect against movement, theft and vandalism • Apply suitable techniques to perform housekeeping of the equipment as per the manufacturer's specification and clean site such as windshields, rails, steps, instrument panel • Demonstrate how to perform visual inspection, identify existing or potential problems communicate concerns to appropriate personnel, such as supervisor, mechanic • Demonstrate the correct startup procedures for a grader, following the manufacturer's recommendations in a controlled training environment. • Design and implement a drainage system in a training environment to prevent haul road erosion and water accumulation, considering different factors like ground conditions, materials being handled, and weather conditions.

• State how to check strip/windrow surface materials according to job specifications while avoiding site obstructions and hazards • Estimate the cost of delays to the organization • Cite how to ensure work surface materials, such as combine, separate, windrow and spread materials as per the job specifications • Estimate the direct/Indirect cost of accidents to the Organization • State the locally prepared emergency response/disaster management plan • Illustrate the symbols and markings, such as colour-coded ribbons, surface paint marks • Read how to establish grade profiles by reading site plans and positioning attachments of the equipment correctly to generate rough/finish grades to job specifications, such as correct elevation • Illustrate job site colour coding for utility grades and stakes • Throw light on how to ensure clean wheels and attachments according to manufacturers' specifications and company policies and procedures • Discuss the types and uses of survey markers, construction grades and stakes • Read the site plan and grade templates • Enlist the equipment manufacturers' specifications for operation of the equipment • Highlight the safety controls and equipment, such as travel alarms, seat belt caution, warning, and hazard decals, lights and symbols • State the job specifications and activities • Throw light on the factors affecting safe operation such as weather ground conditions, utilities	

• Enlist the correct positioning of equipment and stability characteristics of equipment • Discuss about the attachments and specifications • Highlight the procedures and mechanisms for installation of attachments • Explain the operating controls, instrument panel such as gauges, symbols and functions of the equipment • Cite the general understanding of normal operating characteristics • State the site traffic patterns • Highlight the equipment blind spots • Cite the code of signals (Hand/audible and any other signal) • Describe the stability characteristics such as center of gravity, leverage, tipping axis and correct positioning of equipment • Highlight the grades and stakes • Discuss about the surface materials and their characteristics, such as sand, graveland their characteristics e.g. density, moisture content and related phenomenon • State the ways of using scarifier and ripper • Describe about identifying site obstructions and hazards, such as underground utilities • Evaluate the grade profiles and definition of rough and finish grades • Explain the correct procedures recommended by the equipment manufacturer for starting a grader safely. • Describe the factors that need to be considered when optimizing equipment capabilities, such as weather conditions, materials being handled, and site obstructions. • Evaluate the importance of maintaining and adjusting grades, scarifying, and ripping surface materials in relation to	

equipment capabilities and ground conditions. • Apply the knowledge of proper drainage techniques to prevent haul road erosion and water accumulation in various environmental conditions.	
Classroom Aids	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards	
Tools, Equipment and Other Requirements	
Grader, pneumatically and hydraulic power tools, circle, mould board cutting edges (e.g., carbide, standard etc.), ripper tooth, scarifier, drive train, articulating truck, V-blades, one-way blades, push-blades, grade control system [e.g., Global Positioning System (GPS)], laser, shouldering boot, batteries, logbook, equipment manual, exhaust pipe, hammer, screwdrivers, pliers, self-locking pliers, adjustable wrench, grease gun, Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, Gum Boots/ Safety shoes, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts	

Module 4: Transport the grader

Mapped to- MIN/N1418, v1.0

Terminal Outcomes:

- Demonstrate how to prepare grader for transportation
- Display how to drive grader on public roads

Duration: *30:00 (Hours)*	**Duration:** *50:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss about the different types of mines and detail of the mine one is working in • Cite the mine organisation, time keeping, need for discipline and punctuality • State the benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene • Discuss how to respond to code of signals (Hand/audible sounds etc.) • Highlight the standing orders in force at the mine. Safety in the vicinity of machinery • Throw light on how to protect equipment from damage such as cover exhaust pipe etc. • Describe the shot firing and Safety regulations. How and where to take shelter • Explain how to assist with securing Grader and attachment to transport vehicle driver as required such as attach warning flags and reflectors • Highlight the duties of workmen • Discuss the provision of wages, working hours and accident compensation as per Mines act • Describe how to assess and adjust to hazards such as overhead obstructions, narrow landing areas • Cite the mining safety procedures	• Display how to check load grader and attachments for transport such as clean blades and wheels • Show how to load or assist with loading Grader and attachments while avoiding hazards such as uneven ground, utility lines etc. • Demonstrate how to unload or assist with unloading grader and attachments and assist transport driver as required • Show how to check the working of visual attachments, rear view camera etc. • Apply suitable techniques to prepare grader for road travel: secure attachments in proper positions for road travel, complete inspection, such as check brakes, steering, lights, tires, and Back-up warnings, clean equipment • Demonstrate how to drive grader on a public road: comply with applicable legislation, such as possessing appropriate and valid driver's license, follow the route to the destination, adjust to road and weather conditions, such as adjust speed, recognize and avoid potential hazards

• Throw light on the environmental impact on mining safety procedures • Discuss the impact of violation of safely procedures • Evaluate the types of documentation in organization e.g., daily maintenance checklist and importance of the same • Discuss the risk and impact of not following defined procedures/work instructions • Highlight the rules and regulations of mine as per standard operating procedure (SOP) • State the risk and impact of not following Organization's SOP • Throw light on the escalation matrix for reporting identified problems • Describe the manufacturers' specifications of grader and attachments • Explain the company policies and procedures • Describe how to load grader on to different types of transport vehicles such as beaver tail, folding goose neck • Evaluate impact of weather conditions • Illustrate the code of signals (Hand/ audible signals etc.) • Cite how to tie own points of Grader • Highlight the loading unloading technique using proper rigging techniques • Evaluate the applicable legislation, such as traffic laws • Enlist the route and destination • State the proper positioning of attachments for road travel • List down the equipment's limitations on public roads such as speed, blind spots	
Classroom Aids	

LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards
Tools, Equipment and Other Requirements
Grader, pneumatically and hydraulic power tools, circle, mould board cutting edges (e.g., carbide, standard etc.), ripper tooth, scarifier, drive train, articulating truck, V-blades, one-way blades, push-blades, grade control system [e.g., Global Positioning System (GPS)], laser, shouldering boot, batteries, logbook, equipment manual, exhaust pipe, hammer, screwdrivers, pliers, self-locking pliers, adjustable wrench, grease gun, Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, Gum Boots/ Safety shoes, Fire Extinguisher Cylinders, First Aid, Fire Fighting Charts, First Aid Charts

Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102, v1.0

Key Learning Outcomes
Introduction to Employability Skills Duration: 1.5 Hours
1. Discuss the Employability Skills required for jobs in various industries 2. List different learning and employability related GOI and private portals and their usage
Constitutional values - Citizenship Duration: 1.5 Hours
3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen 4. Show how to practice different environmentally sustainable practices.
Becoming a Professional in the 21st Century Duration: 2.5 Hours
5. Discuss importance of relevant 21st century skills. 6. Exhibit 21st century skills like Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. 7. Describe the benefits of continuous learning.
Basic English Skills Duration: 10 Hours
8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone 9. Read and interpret text written in basic English 10. Write a short note/paragraph / letter/e -mail using basic English
Career Development & Goal Setting Duration: 2 Hours
11. Create a career development plan with well-defined short- and long-term goals
Communication Skills Duration: 5 Hours
12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. 13. Explain the importance of active listening for effective communication 14. Discuss the significance of working collaboratively with others in a team
Diversity & Inclusion Duration: 2.5 Hours
15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD. 16. Discuss the significance of escalating sexual harassment issues as per POSH act.
Financial and Legal Literacy Duration: 5 Hours
17. Outline the importance of selecting the right financial institution, product, and service 18. Demonstrate how to carry out offline and online financial transactions, safely and securely 19. List the common components of salary and compute income, expenditure, taxes, investments etc. 20. Discuss the legal rights, laws, and aids
Essential Digital Skills Duration: 10 Hours
21. Describe the role of digital technology in today's life 22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely 23. Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely and securely 24. Create sample word documents, excel sheets and presentations using basic features 25. utilize virtual collaboration tools to work effectively
Entrepreneurship Duration: 7 Hours
26. Explain the types of entrepreneurship and enterprises

27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan 28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement 29. Create a sample business plan, for the selected business opportunity
Customer Service **Duration: 5 Hours**
30. Describe the significance of analyzing different types and needs of customers 31. Explain the significance of identifying customer needs and responding to them in a professional manner. 32. Discuss the significance of maintaining hygiene and dressing appropriately
Getting Ready for apprenticeship & Jobs **Duration: 8 Hours**
33. Create a professional Curriculum Vitae (CV) 34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively 35. Discuss the significance of maintaining hygiene and confidence during an interview 36. Perform a mock interview 37. List the steps for searching and registering for apprenticeship opportunities

Module 5: Follow Health, Safety and Environmental Guidelines for Opencast Mines

Mapped to- MIN/N1703, v2.0

Terminal Outcomes:

- Discuss worksite health and safety measures and environmental guidelines.

Duration: *10:00 (Hours)*	**Duration**: *20:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain how to comply with safety, health, and security-related regulations/guidelines at the open cast mine and safety instructions given by the workman's inspector • Describe about various environmental awareness program related to mining, organized by the various government bodies/ company • Discuss how to follow adequate safety while working at haul roads, heights, overburden dumps, sump area,stockyard, near moving parts, etc. • Recall the safety precautions to be taken while working on sites (sub-station, workshop etc.), with equipment,and conducting welding and cutting operations • Discuss how to follow appropriate Safe Operating Procedure (SOP) while dealing with explosives • Illustrate how to respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of the role and responsibility • Discuss usage of appropriate PPE as per the requirement • Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap • Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task	• **Show how to** provide first aid to an injured person • Display how to operate various types of fire extinguishers to control different types of fire at a worksite when required • Role-play the situations on how to assist supervisor for reducing environmental impact caused due to related mining operations

• State how to report any symptoms of illness to the shift-in-charge • Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS) • List basic mining terminologies and definitions • Explain about the means of access and egress from the mines, location of workshop, haul roads and workingface including dump yards • Outline about the shot-firing / blasting related safety regulations including taking shelter during blasting • Discuss the duties of workers, working hours and accident compensation as per under The Mines act-1952 • Throw light on the hierarchy of the reporting • Recall the proper documents specific to the machine • Discuss about the machine operation, condition of the machine and worksite • Throw light on various problems/ incidents and precautions to be taken when handling heavy equipment • Throw light on the environmental impact of related opencast mining operations • Discuss how to follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines • Explain the process of top soil removal and management and ensure not to mix topsoil with waste in day-to-day tasks • Discuss how to ensure that HEMM is washed at the designated location • Illuminate on how to ensure the productivity of the machine for material/fuel conservation	

• Discuss the mineral conservation practices specified by the organization in accordance with MCDR-2017 (Mineral Conservation and Development Rules) • Discuss the role of workmen inspector, safety committee and internal safety organization • Throw light on the signages, mining area-specific signs, and other safety and emergency signals • State the outcome of violation of safety procedures • Summarise the importance of sensitization towards different genders and PWD (Persons with Disabilities) • Throw light on mine sump and pumping system of the mines • State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site • List the common sources of pollution in the mines and ways to minimize it • Enlist the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, gas detector, safety lamp, self-contained breathing apparatus, gum boots, ear plugs, face mask, etc. • Discuss emergency response /disaster management plan prepared by the organization	
Classroom Aids	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards	
Tools, Equipment and Other Requirements	
Helmet, gloves, harness, earplugs, Safety Goggles, Nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitizers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines	

occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP);

Module 6: Follow Health, Safety and Environmental Guidelines for Underground Metalliferous Mines

Mapped to MIN/N1702, v2.0

Terminal Outcomes:

- Discuss worksite health and safety measures, and environmental guidelines.

Duration: *10:00 (Hours)*	**Duration**: *20:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain how to undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014) • Discuss how to comply with safety, health and security-related regulations/guidelines at the mine e.g. follow Standard Operating Procedure (SOP) for material handling in underground (U/G) mine, safety guidelines specified by Directorate General of Mine Safety (DGMS) • List the precautions to be followed against U/G electrical appliances • List appropriate safety practices while traveling on U/G haul roads, in case of post blast fumes and misfire • Discuss the manufacturer's instructions for care and safe operation of mine machinery and equipment • Discuss about various types of gases found in the mine and their effect • Discuss the laid-out procedure to be followed in case of gas detecting alarm signal on leakage of inflammable gases • Shed light on how to use appropriate PPE as per the requirement • Discuss how to identify six directional hazards at workplace and take decisions accordingly • Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area	• Demonstrate how to operate various types of fire extinguishers to control different types of fire at a worksite when required • Show how to use self-rescue apparatus, appropriately when required • Read line diagram of ventilation circuit to identify the working ventilation district, to direct air to the working face

• Discuss how to follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine • List the different types of machineries used in U/G mines • Throw light on provision of medical examination (IME & PME) of person employed as per Mines Rules 1955 • State the importance of first aid and hygiene • Explain how to take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment • Discuss duties and rights of workers, as well as the safety and occupational health policy of organization • Throw light on the selection process of person for rescue training • Cite about the isolation and sealed off area of the mine • Discuss the various problems/incidents likely to occur and precautions to be taken when handling heavy equipment • State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site • List the common sources of pollution in the mines and ways to minimize it • Discuss how to follow process for reporting any unsafe act/condition in work area to the concerned person • Describe how to use underground mine communication system • Throw light on how to ensure positive isolation near the work place if applicable • Describe about the safety appliances and rescue equipment • State how to report any symptoms of illness to the shift-in-charge • Outline the role of Internal Safety Organisation, safety committee, workman's inspector and DGMS • Discuss the mining area-specific signs, and other safety and emergency signals and the outcome of violation of safety procedures	

• List the role and responsibilities of rescue room and rescue station and how to contact them incase of emergency • State the importance of taking shelter at the miner's station during blasting operation • Discuss about the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots, ear plugs, Face Mask, etc. and importance of FAB (Fresh Air Base) • Describe shot-firing / blasting related safety regulations including taking shelter during blasting • Throw light on the emergency response /disaster management plan prepared by the organization as per DGMS guideline • Explain the rules and regulations for safety and security while handling hazardous materials • Outline the basic provisions in Mines Creche Rules, 1966 (MCR) for females employed in the mines • Discuss the importance of sensitization towards different genders and persons with disabilities. (PWD) • Explain the importance of following infection control policies, '5-S' practices, and waste management • Discuss the importance of water/material/energy conservation and management • Discuss Safety Management Plan (SMP) and Emergency Management Plan (EMP) • Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap • Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task • Discuss the environmental impact of mining related operations and steps to reduce those impacts	

• Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery • Explain how to ensure that stowing practices produce minimum disturbance to the surface • Discuss how to ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place • Explain how to ensure the productivity of the machine for material/fuel conservation	

Classroom Aids

LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards

Tools, Equipment and Other Requirements

Helmet, gloves, harness, earplugs, Safety Goggles, Nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitisers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP);

Module 7: Follow Health, Safety and Environmental Guidelines for Underground Coal Mines

Mapped to- MIN/N1704, v2.0

Terminal Outcomes:

- Discuss worksite health and safety measures and environmental guidelines.

Duration: *10:00 (Hours)*	**Duration**: *20:00 (Hours)*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the preventive measures against firedamp, white damp, blackdamp etc. • Explain how to undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014) • Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR while undertaking work in an area • Throw light on various types of gases available in the mine and their effects; and their control measures • Discuss how to comply with safety, health and security-related regulations/guidelines at the mine e.g., SOP for material handling in underground (U/G) mine • Describe how to ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle • List the safety precautions to be followed against spontaneous heating of the coal • Discuss how to ensure that no person is traveling/working/staying under unsupported roof • Throw light on how to take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment • Discuss Safety Management Plan (SMP) and Emergency Management Plan (EMP) and precautions against U/G electrical appliances	• Show how to use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP) • Demonstrate how to operate various types of fire extinguishers to control different types of fire at worksite, if required • Display how to use self-rescue apparatus appropriately when required. • Read the line diagram of ventilation circuit to identify the working ventilation district to direct air to the working face • Apply appropriate techniques to ensure that every instrument, apparatus and equipment are DGMS approved before these are used • Demonstrate how to ensure that Armored face conveyor (AFC) and chocks must be kept in straight line for every cycle of operations and tightened up to the setting pressure while keeping it in full contact with the roof, applicable for longwall mining • Show how to provide first aid to an injured person • Role-play the situations on how to report any symptoms of illness to the shift-incharge

• Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS)and selection process of person for rescue training • Elucidate on how to take proper care against damage and accidents while loading, transporting, dismantling and erecting of roof supports • Throw light on how to follow appropriate SOP while working near any isolated and sealed off area of the mine • Discuss the provision of medical examination (Initial Medical Examination (IME) & Periodical Medical Examination (PME)) of a person employed, as per Mines Rules 1955 • List different types of machineries used in U/G mines • Enlist different types of supporting system used in U/G mines as per SSP and SSR • Cite precautions to be taken when handling heavy equipment • Discuss how to ensure that the roof and sidewalls of the mine face (or newly exposed area of the mines) have been scaled/ dressed properly • List relevant safety precautions to be taken during depillaring operation in UCM • Recall the safety precautions to be followed while traveling on U/G haul roads, in case of post blast fumes and misfire • Discuss the manufacturer's instructions for care and safe operation of mine machinery and equipment • Throw light on the laid-out SOP in case of alarm signal for leakage of inflammable gases • Explain the process of reporting any unsafe act/condition in the working area to the concerned person • Discuss how to use underground mine communication system • Elucidate how to ensure positive isolation near the work place if applicable	

• Discuss how to use appropriate Personal Protective Equipment (PPE) as per the requirement and safety equipment • Explain how to maintain hand hygiene by washing hands with alcohol-based sanitisers/soap, disinfect the machine/tools before and after work/task and maintain hygiene at the work site • Discuss how to identify six directional hazards at workplace and take decisions accordingly • Discuss the environmental impact of mining related operations and steps to reduce those impacts • Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery • Describe how to ensure that the stowing practices produce minimum disturbance to the surface • Summarise how to ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place • Throw light on how to ensure the productivity of the machine for material/fuel conservation • Outline the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines • Discuss the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc • Discuss the duties and rights of workers • List the various problems/incidents likely to occur • Throw light on the role of Internal Safety Organization, safety committee, workman's inspector and DGMS. • State mine safety standard including light illumination level, noise levels, dust level, pollutants, etc. at the work-site • List common sources of pollution in the mines and ways to minimize it	

• Discuss shot-firing / blasting related safety regulations including taking shelter during blasting • Recall mining area-specific signs, and other safety and emergency signals • Discuss the outcome of violation of safety procedures • List safety appliances and rescue equipment • Discuss the safety and occupational health policy of organisation • Explain the importance of FAB (Fresh Air Base) • State basic provisions in Mines Creche Rules, 1966 (MCR) for any females employed in the mines • Discuss about basic safety regulations of Coal Mines Regulation,2017 (CMR) • List types of stone dust barrier and its importance • Explain coal dust explosion and its preventive measures • Outline the classification of coal mines as per the degree of gassiness of coal seams such as first degree, second degree, and third-degree mines • List the precautions as per the gassiness of the coal mines • Discuss about coal mines occupational disease such as pneumoconiosis or 'black lung' and their preventive measures • List the roles, duties and responsibilities of rescue team members, rescue room and rescue station and how to contact them in case of emergency • Enlist the correct steps for conducting any rescue work as per Mine Rescue Rule (MRR) • Summarize the importance of sensitization towards different genders and persons with disabilities (PWD) • Discuss the importance of waste management, hazardous material safety, security rules and regulations	

• Throw light on importance of water/material/energy conservation and management	
Classroom Aids	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair & Table, Demonstration Table, Pin Up Boards	
Tools, Equipment and Other Requirements	
Helmet, gloves, harness, earplugs, Safety Goggles, Nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitisers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP);	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Class 10th	NA	6	Relevant experience required in Grader Operation.	NA	-	-
OR						
ITI	NA	6	Relevant experience required in Grader Operation.	NA	-	-
OR						
Diploma	Mining / Mechanical / Electrical	5	Relevant experience required in Grader Operation.	NA	-	-
OR						
B-Tech	Mining / Mechanical / Electrical	4	Relevant experience required in Grader Operation.	NA	-	-

Trainer Certification	
Domain Certification	**Platform Certification**
MIN/Q1405, v1.0 Grader Operator. Minimum accepted score as per SSC guideline is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0". Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Class 10th	NA	8	Relevant experience required in Grader Operation.	NA	-	-
OR						
ITI	NA	8	Relevant experience required in Grader Operation.	NA	-	-
OR						
Diploma	Mining / Mechanical / Electrical	7	Relevant experience required in Grader Operation.	NA	-	-
OR						
B-Tech	Mining / Mechanical / Electrical	6	Relevant experience required in Grader Operation.	NA	-	-

Assessor Certification	
Domain Certification	**Platform Certification**
MIN/Q1405, v1.0 Grader Operator. Minimum accepted score as per SSC guideline is 80%.	Recommended that the Assessor is certified for the Job Role: "Assessor (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2701, v2.0". Minimum accepted score is 80%.

Assessment Strategy

Assessment system Overview: -

Assessment will be carried out by SCMS affiliated assessment partners. Based on the results of assessment, SCMS certifies the learners. Candidates have to pass online theoretical assessment which is approved by SCMS.

The assessment will have both theory and practical components in 30:70 ratio.

While theory assessment is summative and an online written exam; practical will involve demonstrations of applications and presentations of procedures and other components. Practical assessment will also be summative in nature.

Testing Environment: -

Training partner has to share the batch start date and end date, number of trainees and the job role.

Assessment is fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue.

Question bank of theory and practical will be prepared by assessment agency and approved by SCMS. From this set of questions, assessment agency will prepare the question paper. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on theoretical knowledge of the subject.

The theory and practical assessments will be carried out on same day. If number of candidates are many, more assessors and venue will be organized on same day of the assessment.

Assessment			
Assessment Type	**Formative or Summative**	**Strategies**	**Examples**
Theory	Summative	Written Examination	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks	Presentation
Viva	Summative	Questioning and Probing	Mock interview on topics

Assessment Quality Assurance framework

Only certified assessor can be assigned for conducting assessment. Provision of 100 % video recording with clear audio to be maintained and the same is to be submitted to SCMS.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue.

Methods of Validation: -

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, id verification will be carried out. Aadhar card number is required of registering the candidate for training. This will form the basis of further verification during the assessment. Assessor conducts the assessment in accordance with the assessment guidelines and question bank as per the job role. The assessor carries tablet with the loaded questions. This tablet is geo tagged and so it is monitored to check their arrival and completion of assessment. Video of the practical session is prepared and submitted to SCMS. Random spot checks/audit is conducted by SCMS assigned persons to check the quality of assessment. Assessment agency will be responsible to put details in SIP.

SCMS will also validate the data and result received from the assessment agency.

Method of assessment documentation and access

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by SCMS assessment team. After upload, only SCMS can access this data. SCMS approves the results within a week and uploads on SIP.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards